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The activity under this grant concentrated on:

1) post-launch calibration of the HARP instrument; and

2) analysis and interpretation of the data from the HARP and other related instruments.

The HARP was taken by scientists and engineers from the Hungarian Central Research Institute for Physics [CRIP] to NASA/MSFC for calibration in their plasma chamber, with partial support of this grant. This electron and ion calibration of the HARP, helped in transforming measured currents to actual flux values.

The analysis and interpretation of the data, carried out jointly by our Russian and Hungarian colleagues and us, led to a number of journal publications and presentations at scientific meetings. A list of papers, based on work partially supported by this grant, is listed below.

Journal Publications:

Observation of electron and ion fluxes in the vicinity of Mars with the HARP spectrometer. Shutte et al., Nature, 341, 614, 1989.

Wave activity in the neighborhood of the bowshock of Mars, Sagdeev et al., Geophys. Res. Lett., 17, 893, 1990.

Venus mantle - Mars planetosphere: What are the similarities and differences, A. F. Nagy, T. I. Gombosi, K. Szego, R. Z. Sagdeev, V. D. Shapiro, and V. I. Shevchenko, Geophys. Res. Lett., 17, 865, 1990.

The Harp Electron and Ion Sensor on the PHOBOS Mission, I. T. Szucs, I. Szemerey. P. Király, S. Szendro, M. Tátrallyay, A. Tóth, T. E. Cravens, T. I. Gombosi, A. F. Nagy, W. E. Sharp, V. V. Afonin, K. I. Gringauz, S. Sheronova, N. M. Shutte, and M. I. Verigin, Nucl . Inst. Meth., A290, 228, 1990.

The HARP plasma experiment on-board the Phobos 2 spacecraft: Preliminary results, P. Kiraly et al., Planet. Space Sci., 39, 139, 1991.

Energy distribution of electrons with E<800 eV in the aereomagnetosphere, N. M. Shutte et al., Planet. Space Sci., 39, 147, 1991.

On the possible source of the ionization in the nighttime martian ionosphere: 1. Phobos 2 HARP electron spectrometer measurements, M. I. Verigin et al., J. Geophys. Res., 96, 19,307, 1991.

Physical processes in the plasma mantle of Venus, Szego et al., Geophys. Res. Lett., 18, 2305, 1991.

Calculated ionization rates, ion densities and airglow emission rates due to precipitating electrons in the nightside ionosphere of Mars, S. A. Haider et al., J. Geophys. Res. 97, 10,637, 1992.

The structure of the dayside boundary layer between the Venus ionosphere and the shocked solar wind, K. Szego, Z. Dobe, W. C. Knudsen, A. F. Nagy, V. D. Shapiro and V. I. Shevchenko, ESA SP-346, 31, 1992.

Oxygen ionization rates at Mars and Venus: Relative contributions of impact ionization and charge exchange, M. H. G. Zhang, J. G. Luhmann, A. F. Nagy, J. Spreiter and S. Stahara, J. Geophys. Res., 98, 3311, 1993.

Papers Presented at Meetings:

Venus mantle-Mars planteosphere: What are the similarities?, A. F. Nagy, T. I. Gombosi, K. Szego, R. Z. Sagdeev, V. D. Shapiro, and V. I. Schevchenko, paper to be presented at the Chapman Conference of Mars and Venus, Balatonfured, Hungary, 1990.

Wave activity in the dayside martian magnetosphere, Sagdeev, et al., Paper presented at the XVIII COSPAR Meeting, The Hague, 1990.

Venus mantle - Mars planetosphere: What are the similarities?, Nagy, et al., Paper presented at the XVIII COSPAR Meeting, The Hague, 1990.

Mantle region around Venus and Mars, A. F. Nagy et al., paper presented at the IUGG/IAGA Meeting, Vienna, Austria, 1991.

Ionization rates at Mars: Implications for Phobos-2 observations, M. H. G. Zhang, J. G. Luhmann, A. F. Nagy, J. R. Spreiter and S. S. Stahara, EOS, AGU Fall Meeting, 1991.

Ionization rates at Mars; Implications for Phobos-2 observations, M. H. G. Zhang, J. G. Luhmann, A. F. Nagy, J. R. Spreiter and S. S. Stahara, EOS, AGU Spring Meeting, 1992.

The structure of the dayside boundary layer between the Venus ionosphere and the shocked solar wind, K. Szego, Z. Dobe, W. C. Knudsen, A. F. Nagy, V. D. Shapiro and V. I. Shenchenko, XVI ESLAB Symposium, Killarney, Ireland, 1992.

The mantle region around nonmagnetic planets, K. Szego, V. D. Shapiro, V. I. Shevchenko and A. F. Nagy, XIX COSPAR Meeting, Washington, D. C., 1992.